



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Great Lakes Region  
Illinois, Indiana, Michigan,  
Minnesota, North Dakota,  
Ohio, South Dakota,  
Wisconsin

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Des Plaines, Illinois 60018

**POLICY AND PROCEDURES MEMORANDUM - AIRPORTS DIVISION**

Number: 5330.1  
Date: JUN 27 1994  
Subject: Line of Sight Analysis for Airport Layout Plans and  
Airspace Studies  
Cancellation: None  
References: 1. FAA Order 7400.2D, Procedures for Handling  
Airspace Matters, paragraphs 10-7 and 11-30.  
2. AC 150/5300-13, Chg. 3, Airport Design,  
paragraph 202.f.  
Appendices: 1. Information Suggested for Line of Site Analysis  
2. Resolution of Comments (Internal Use Only)  
3. Airway Facilities Division Requirements to Complete  
Shadow Studies

1. **Background:** This policy is intended to assure the review of proposed airport construction with respect to the air traffic controller's ability to see aircraft on airport operational areas or on final approach. At airport locations with an existing or proposed airport traffic control tower (ATCT), a line-of-sight engineering analysis is normally necessary to determine if a portion of the airport operating area or final approach area is shielded from view from the control tower. (The ATCT for this PPM is either FAA operated or non-FAA operated.) The references are unclear as to who provides the information for the engineering analysis. This PPM clarifies that the sponsor/proponent should provide all the information necessary for the line-of-sight analysis; and the FAA, through the airspace review process, conducts the line of sight analysis and determines whether or not a conflict exists on an airport.

2. **Policy/Procedures:**

a. The FAA line-of-sight analysis is necessary for airports with existing or proposed ATCTs. This analysis, when part of the ALP, is found acceptable when the ALP is approved. This analysis, when part of an airspace study, is found acceptable when the proposal is found non-objectionable.

b. A line-of-sight analysis will not be necessary if the structure is in full conformance with the approved ALP.

c. The information provided by the sponsor/proponent for the line-of-sight analysis can be limited to an airport drawing or sketch of acceptable scale (such as the Airport Master Record, FAA Form 5010) showing the ATCT, the movement areas and the proposed structure(s) when the proposed structure(s) does(do) not have the potential to affect the air traffic controller's line-of-sight. This should be included with the proponent's airspace submission.

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d. The following information, format, and process is needed with the Airport Layout Plan (ALP), as a minimum, to accomplish ATCT line-of-sight analyses:

(1) A drawing of acceptable scale (normally 500:1) in plan view, to clearly show the existing and future ATCT location and the existing and future airport pavement operational areas to be controlled by the ATCT.

(2) Airport operational areas that may be blocked from the air traffic controller's view. These areas should be clearly indicated on the drawing by shading or other means acceptable to the Airport District Office (ADO).

(3) The ATCT cab floor elevation and assumed controller eye elevation.

(4) The location and top elevation(s) of any building or structure that may block the air traffic controller's view of the airport operational areas. The building material and anything unique to the structure should also be identified to help the FAA determine if a glare or adverse light reflection situation should be studied. (NOTE: For areas on the airport where building or structure elevations are not known, a separate study will be needed once these elevations are known.)

(5) The line-of-sight analysis should be of similar format and style as other ALP sheets. The analysis may be superimposed onto any ALP sheet if all information can be clearly shown. This judgment is left to the ADO.

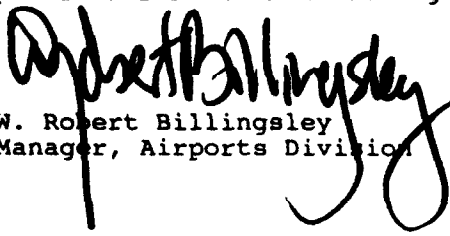
(6) The sponsor should submit information for the line-of-sight analysis to the ADO when the ALP is ready for airspace review and approval. The FAA airspace review of the ALP will determine if there are any line-of-sight conflicts.

e. For individual building/structure airspace studies, the following information and format is needed in addition to the normal airspace submittal requirements:

(1) The same information as indicated in 2.d.(1), 2.d.(2), and 2.d.(3) above.

(2) The location and elevation(s) of the proposed structure on the airport or between the ATCT and the approach to a runway. The building materials and anything unique about the structure should be identified so issues relative to glare or reflection of light into the controller's eye can be resolved.

f. Appendix 1 is a suggested list of information that should be provided for the line-of-sight analysis.



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Appendix 1

Appendix 1 - Information Suggested for the Line-of-Sight Analysis

1. General Information:

a. If the FAA determines there are no line-of-sight conflicts based upon the airspace review, a clear statement stating such should be on the Airport Layout Plan. This statement may be included in the ALP approval letter affixed to the ALP

b. If the information listed under No. 2 below can be clearly shown on an ALP plan sheet or sketch showing the proposed development, a separate line-of-sight analysis sheet is not necessary.

2. The drawing or attachment containing the line-of-sight analysis should provide the following information:

a. Airport Traffic Control Tower:

(1) Existing and any future location.

(2) Cab floor and controller eye elevation (the controller eye elevation is normally five feet above the cab floor elevation).

b. Building, Development, and/or Structure:

(1) Location and orientation in relationship to the airport traffic control tower and the airport operational area pavements.

(2) Ground elevation(s) and top elevation(s), including vision-blocking appurtenances. For a large structure, the corner elevations may be required.

(3) Any details or unique features of the walls, rooflines, etc. that may affect the shape and size of areas that may block the air traffic controller's view of the airport operational area.

(4) Proposed building material to help identify glare or adverse light reflection issues.

c. Airport Operational Area:

(1) Operational pavements adjacent to existing and proposed buildings/structures.

(2) Any proposed pavement areas relative to the building/structure.

APPENDIX 3 - AIRWAY FACILITIES  
DIVISION REQUIREMENTS TO COMPLETE  
A SHADOW STUDY

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APPENDIX 3  
PPM 5330.1

**INFORMATION:** Shadow Study Requirements for  
Airspace Studies

**DATE:** 6/6/94

Below are the Airway Facilities Division list of requirements needed to complete shadow studies:

a. The Airway Facilities Division will provide cab elevation information for all towers that have been designed and built by the FAA. AGL-464 will provide this information to the sponsor when requested; the point of contact is Mr. Joe Nakanishi, (708) 298-8776. Cab elevation information on towers built or owned by sponsors are not available from the FAA. This information can be provided from the sponsor since they maintain these facilities and keep their own drawings. The FAA does not keep drawings for sponsor owned and maintained towers.

b. Information should be provided in a format that allows adequate interpretation and evaluation for the required shadow study. A 500:1 scale drawing is recommended to give an overall view of the ATCT, building, structure and pavement area involved. The 500:1 scale is a suggested minimum size; larger scales will be acceptable.

c. "D" size ALP drawings are suggested minimum size; larger size ALP drawings will be acceptable. ALP drawings that are smaller than the recommended "D" size, will require that the portions of the ALP needed to adequately show the area for the shadowing be drawn to the acceptable minimum scale of 500:1.

d. If the sponsor has an ALP or line-of-sight shadowing drawings available on Auto Cad, this information can be converted here at the Regional Office to Autotrol. For future shadow studies, we recommend that sponsor's submit ALP or line-of-sight shadowing drawings in Auto Cad Version 12 format with GIS information. Information in this format could expedite subsequent or future shadow studies.

e. Shadow studies are not required if the airport does not have an ATCT facility. For those airports that do have an ATCT facility, the ALP and the resulting line of sight shadowing drawings should depict the ATCT facility as well as the proposed new building or structure expected to produce shadowing. Sponsor's should also remember that shadow studies may need to be made of existing air traffic control surface movement areas, if new buildings or structures are proposed adjacent to existing air traffic control surface movement areas, or if new air traffic control surface movement areas are proposed next to existing buildings or structures on the airport.

f. The airport sponsor should provide a list of changes made to the latest approved ALP. This list of changes should contain the following information:

- (1) Whether the change has been or needs to be studied.
- (2) If the change has been studied, list case number (NRA, NR, or NS).
- (3) Description of the change.
- (4) Highlight each change of the ALP.
- (5) Coordinates, ground elevation, and top elevation of each change.
- (6) If the change required a shadow study, state when it was made.

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g. An example of a shadow study might be the construction of a freight building on an airport. The FAA will perform the shadow study and will determine if the construction of the building, as proposed, would block the line of sight from the ATCT facility to existing or future air traffic control surface movement areas. The sponsor should provide the ALP and the line of sight shadowing drawings so that depth of the shadow caused by the proposed freight building can be determined and its impact noted in relation to the air traffic control surface movement area.

h. The ALP and the line of sight shadowing drawings should contain the following information:

- |     |                    |   |
|-----|--------------------|---|
| (1) | ATCT               | Highlight location on ALP<br>State cab elevation (MSL)<br>State ground elevation (MSL)  |
| (2) | BUILDING/STRUCTURE | Highlight location on ALP<br>State peak roof elevation (MSL)<br>State corners Roof elevation (MSL)<br>State ground elevation (MSL)<br>State distance to/from ATCT<br>State size of building/structure |
| (3) | MOVEMENT AREA      | Highlight location on ALP<br>State ground elevation (MSL)<br>State distance to/from ATCT<br>State distance to/from building/structure   |

NOTE: MOVEMENT AREA includes air traffic control surfaces such as taxiways, runways, holding aprons and run up pads. Those air traffic control surface movement areas where the air traffic controller needs to view ground air traffic.

i. If the proposed building/structure/movement area does not contain the information listed in paragraph "h." at the time the ALP is developed, then they should be studied as separate NRA airspace cases. These NRA cases should reference the ALP case number, should show the location of the proposed building/structure/movement area in relation to the ATCT facility, and should provide the required information listed in paragraph "h." This would be required for airports with an ATCT facility only. It is important that each NRA study include the required FAA form 7460-1, since most of the information requested in paragraph "h." is provided on this form.